

CLAIMS

What is claimed is:

1. A jelly-roll type battery unit comprising:
 - a first electrode plate having a first electrode current collector with a first electrode tab, and a first electrode active material layer coated on at least one surface of the first electrode current collector;
 - a second electrode plate having a second electrode current collector with a second electrode tab, and a second electrode active material layer coated on at least one surface of the second electrode current collector; and
 - a separator that is interposed between the first electrode plate and the second electrode plate, wherein the first or the second electrode tab is incorporated into the electrode current collector in an area of either the first or the second electrode plate where the corresponding electrode active material layer is not coated.
2. The jelly-roll type battery unit of claim 1, wherein the first or the second electrode tab is formed by cutting a portion of a winding start portion of the electrode current collector and folding the portion of the winding start portion upward.
3. The jelly-roll type battery unit of claim 1, wherein the first or the second electrode tab is formed by cutting a portion of a winding completion portion of the electrode current collector and folding the portion of the winding completion portion upward.
4. The jelly-roll type battery unit of claim 1, wherein the first or the second electrode tab is cut at least in half widthwise with respect to the electrode current collector to be exposed toward the upper end of the electrode current collector.
5. The jelly-roll type battery unit of claim 4, further comprising an insulating tape adhered to either surface of the first or the second electrode tab.

6. The jelly-roll type battery unit of claim 5, wherein the insulating tape is interposed between the inner and outer surfaces of the first or the second electrode tab that is folded upward.

7. The jelly-roll type battery unit of claim 4, wherein the first or the second folded electrode tab partially overlaps with the electrode current collector having the opposite polarity.

8. A method of winding a jelly-roll type battery unit comprising:
forming a first electrode plate wherein a first electrode tab formed at a first electrode current collector is integrally connected to the first electrode current collector at a winding start portion of the first electrode current collector;
forming a second electrode plate having a second electrode current collector with a second electrode tab attached thereto;
preparing a separator interposed between the first and second electrode plates; and
winding the first and second electrode plates together with the separator interposed therebetween.

9. The method of claim 8, wherein in forming the first electrode plate, the first electrode tab is formed by cutting a portion of the first electrode current collector and folding the portion of the first electrode current collector upward.

10. The method of claim 9, wherein an end of the first electrode tab is cut at least in half widthwise with respect to the first electrode current collector to be exposed toward the upper end of the first electrode current collector.

11. The method of claim 10, wherein the first electrode tab is cut widthwise with respect to the first electrode current collector.

12. The method of claim 8, further comprising an insulating tape adhered to either surface of the first electrode current collector having the first electrode tab.

13. The method of claim 8, wherein the first electrode tab is wound to partially overlap another electrode current collector having an opposite polarity .

14. A lithium secondary battery comprising:

a battery unit having a first electrode plate having a first electrode tab, a separator and a second electrode plate of an opposite polarity to the first electrode plate, the second electrode plate having a second electrode tab, sequentially disposed;

a can having a space in which the battery unit is housed; and

a cap assembly connected to an upper portion of the can, and having a cap plate and an electrode terminal connected to the cap plate through a terminal throughhole formed in the cap plate and having a gasket at an outer surface for insulation from the cap plate, wherein the first electrode plate includes a first electrode current collector formed by cutting a portion of the first electrode current collector and folding the portion of the first electrode current collector upward to form a first electrode tab, and a first electrode active material coated on at least one plane of the first electrode current collector, and the second electrode plate includes a second electrode current collector with a second electrode tab attached thereto, and a second electrode active material coated on at least one plane of the second electrode current collector.

15. The lithium secondary battery of claim 14, wherein an end of the first electrode tab is cut at least in half widthwise with respect to the first electrode current collector from an area where an electrode active material layer is not coated to be exposed toward the upper end of the first electrode current collector.

16. A jelly-roll type battery unit comprising:

a first tri-functional electrode unit;

a second tri-functional electrode unit; and

a separator interposed between the first tri-functional electrode unit and the second tri-functional electrode unit,

wherein the first tri-functional electrode unit and the second tri-functional electrode unit are wound, with the separator therebetween, to form the battery unit.

17. The jelly-roll type battery unit of claim 16, wherein:

the first tri-functional electrode unit comprises a first plate having a first electrode current collector with a first electrode tab, and a first electrode active material layer coated on at least one surface of the first electrode current collector;

the second tri-functional electrode unit comprises a second electrode plate having a second electrode current collector with a second electrode tab, and a second electrode active material layer coated on at least one surface of the second electrode current collector; and

the separator is interposed between the first electrode plate and the second electrode plate, wherein the first or the second electrode tab is incorporated into the electrode current collector in an area of either the first or the second electrode plate where the corresponding electrode active material layer is not coated.

18. The jelly-roll type battery unit of claim 16, wherein the first or the second electrode tab is formed by cutting a portion of a winding start portion of the electrode current collector and folding the portion of the winding start portion upward.

19. The jelly-roll type battery unit of claim 16, wherein the first or the second electrode tab is formed by cutting a portion of a winding completion portion of the electrode current collector and folding the portion of the winding completion portion upward.

20. The jelly-roll type battery unit of claim 16, wherein the first or the second electrode tab is cut at least in half widthwise with respect to the electrode current collector to be exposed toward the upper end of the electrode current collector.

21. The jelly-roll type battery unit of claim 20, further comprising an insulating tape adhered to either surface of the first or the second electrode tab.

22. The jelly-roll type battery unit of claim 21, wherein the insulating tape is interposed between the inner and outer surfaces of the first or the second electrode tab that is folded upward.

23. The jelly-roll type battery unit of claim 20, wherein the first or the second folded electrode tab partially overlaps with the electrode current collector having the opposite polarity.

24. The jelly-roll type battery unit of claim 2, wherein the portion of the electrode current collector that is cut and folded upward prevents deformation of the jelly-roll type battery unit.

25. The jelly-roll type battery unit of claim 2, wherein material cost of the jelly-roll type battery unit is minimized by cutting a portion of the winding start portion and folding upward to form the first or the second electrode tab.

26. The jelly-roll type battery unit of claim 2, wherein the portion of the electrode current collector that is cut and folded upward as the first or the second electrode tab prevents an increase in internal resistance due to use of an electrode tab made of different metals.

27. The jelly-roll type battery unit of claim 4, further including a plurality of insulating tapes attached to both surfaces of the electrode current collector having an electrode tab incorporated theretinto to prevent an electrical short-circuit between electrode plates of opposite polarities during assembling of the battery unit.

28. The jelly-roll type battery unit of claim 27, wherein the plurality of insulating tapes are attached to both surfaces of an electrode tab formed by cutting an electrode current collector and folding an end portion of the electrode current collector up prevent electrical short-circuit due to burring of the electrode tab.